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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,133	08/26/2004	Charles Y. Tsang	AP04-1	5132
25759	7590	03/23/2005	EXAMINER	
JOHN J. ELNITSKI, JR. 225 A SNOWBIRD LANE BELLEFONTE, PA 16823			PRUCHNIC, STANLEY J	
			ART UNIT	PAPER NUMBER
			2859	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/711,133	Applicant(s) TSANG ET AL.	
	Examiner Stanley J. Pruchnic, Jr.	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 18, 24-26, 28-32, 35, 36 and 1017 is/are rejected.
- 7) ☒ Claim(s) 2-9, 11-16, 19-23, 27, 33 and 34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:
  - a. In page 13 [Para 44], Line 28, perhaps after "cable", the reference character "7" should be deleted and replaced therefor by --44-- in order to clearly describe the invention.Appropriate correction is required.

### *Claim Objections*

2. **Claims 3, 15, 27-34 and 36** are objected to because of the following informalities:
  - a. In **Claim 3**, Line 6, perhaps "be" before "directed" should be deleted and replaced therefor by --been-- in order to correct the grammar.
  - b. In **Claim 15**, Line 3, *perhaps* insert --of the light detector-- before the phrase "is a fiber optic cable" in order to even more clearly describe the invention. This is not required, but only suggested.
  - c. In **Claim 27**, Line 12, please delete the last word "and"; then, in line 14, insert a semicolon (";") after "sensor" at the end of the line.
  - d. In **Claim 28**, Line 14, please insert --and-- after "the light detector" in order to more clearly describe the invention, correcting a minor grammatical error.
  - e. In **Claim 29**, Line 1, perhaps "further using a" before "detection volume" should be deleted and replaced therefor by --wherein the-- in order to clearly describe the invention; and in same line; perhaps then also delete the last word "having" and replace therefor --has-- in order to use correct grammar.
  - f. In **Claim 30**, Line 1, perhaps "further using a" before "the detection" should be deleted in order to clearly describe the invention.

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- g. In **Claim 31**, Line 36, perhaps "an" before "a recorded" should be deleted in order to correct the grammar.
- h. In **Claim 32**, Line 1, please insert --the-- before "temperature" in order to clearly describe the invention.
- i. In **Claim 32**, Line 7, perhaps the first word "changes" before "at the slower rate" should be deleted and replaced therefor by --change was detected-- in order to clearly describe the invention; and then, after "at the slower rate", please insert --of cooling--; and then, in Lines 7-8, perhaps delete "an accurate determination of" in order to clearly describe the invention.
- j. In **Claim 33**, Line 2, please insert --cloud point-- before "temperature" in order to clearly describe the invention; then delete, after the same word "temperature", the phrase " known as the cloud point".
- k. In **Claim 33**, Line 6, perhaps "know relationships" before "between" should be deleted and replaced therefor by --a relationship-- in order to clearly describe the invention.
- l. In **Claim 34**, Line 2, perhaps after "to correlate the", the phrase "recorded temperature known as the determined" should be deleted in order to clearly describe the invention.
- m. In **Claim 34**, Line 3, please insert --an-- before "approximate" in order to clearly describe the invention.
- n. In **Claim 34**, Line 4, please insert --the-- before "energy content" in order to clearly describe the invention.
- o. In **Claim 36**, Line 3, perhaps "first" before "crystals" should be deleted.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

- 3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 18 and 26** are rejected under 35 U.S.C. 102(b) as being anticipated by Jones *et al.* (U. S. Pat. No. 4,519,717, hereinafter **JONES**).

**JONES** discloses a cloud point monitoring device as claimed by Applicant in

**Claims 1, 18 and 26**, comprising:

Regarding **Claim 1**: **JONES** discloses a cloud point monitoring device (test cell 20; Fig. 3), for determining formation of wax crystals in diesel fuel, comprising:

- a thermal conductive surface (glass tube 22 and sample block 24);
- a thermal device (T/E modules 26, 28) to change thermal conditions of said thermal conductive surface;
- a detection volume (point of measurement 46) in close proximity to said thermal conductive surface, open to the fuel flow system to allow fuel to flow through said detection volume;
- a temperature sensor (thermocouple 40; Col. 3, Lines 31-34) to sense temperature of the diesel fuel in said detection volume;
- a light source (lamp 42) which directs light into said detection volume;
- a light detector (photocell 50) to detect a change in light level from said light source in said detection volume, said change in light level being relative to the positioning of said light source in relation to said light detector (**JONES** discloses the light source 42 is positioned in-line with the light detector 50; Fig. 3); and
- a data acquisition and control unit (microprocessor IC220; Col. 4, Lines 11- Col. 6, Line 37) to monitor light level from said light detector and monitor diesel fuel temperature from said temperature sensor.

Regarding **Claim 18**: said light source is positioned relative to said light detector (**JONES** discloses the light source 42 is positioned in-line with the light detector 50; Fig. 3), whereby, because of this relative positioning, there is a decrease in said light level due to the formation of said wax crystals, whereby the formation of said wax crystals blocks said light away from said light detector; and regarding **Claim 26**: all of the light from said light source is detected by said light detector when there are no wax crystals in the fuel, since it is directed straight through, and the first wax crystals formed will inherently be formed at the coldest location, which would normally be at the thermal conductive surface, and the light source and light detector are mounted very near as claimed by Applicant.

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5. **Claims 1, 10, 17, 24-25, 28-31 and 35-36** are rejected under 35 U.S.C. 102(b) as being anticipated by Laurent *et al.* (U. S. Pat. No. 5,007,733, hereinafter **LAURENT**).

**LAURENT** discloses a cloud point monitoring device as claimed by Applicant in **Claims 1, 10, 17, 24-25, 28-31 and 35-36**, comprising:

Regarding **Claim 1**: **LAURENT** discloses a cloud point monitoring device, for determining formation of wax crystals in diesel fuel, comprising:

- a thermal conductive surface (cell or tank 20 - has a surface 32 which inherently conducts heat);
- a thermal device (Peltier elements 63, 64) to change thermal conditions of said thermal conductive surface;
- a detection volume (chamber 50; Col. 3, Lines 57-60) in close proximity to said thermal conductive surface, capable of being open to the fuel flow system of the vehicle to allow fuel to flow through the detection volume, through inlet 55 and outlet 58 (Figs. 2-3);
- a temperature sensor 59 (Col. 3, Lines 35-38) to sense temperature of the diesel fuel in said detection volume;
- a light source 10 which directs light into said detection volume;
- a light detector (large area photodetector 16) to detect a change in light level from said light source in said detection volume, said change in light level being relative to the positioning of said light source in relation to said light detector; and
- a data acquisition and control unit to monitor light level (Col. 2, Lines 36-46) from said light detector 16 and monitor diesel fuel temperature from said temperature sensor 59, inherently included in the device of **LAURENT**, since functions of data acquisition and control (Col. 3, Lines 51-56) are required to be done in the device, as claimed by Applicant.

Regarding **Claim 10**, the temperature sensor (thermocouple 59) is embedded in the thermal conductive surface as claimed by Applicant.

Regarding **Claim 17**: said light source is positioned relative to said light detector, such that there is an increase (Col. 2, Lines 36-46) in said light level due to the formation of said wax crystals, whereby the formation of said wax crystals scatters said light towards said light detector 16.

Regarding **Claim 24**: **LAURENT** further discloses directing the light toward the detection volume, having surfaces of said thermal conductive surface near said detection volume which are inherently reflective to reflect light and enhance the scattering of light towards said light detector (See Col. 2, Line 37; where **LAURENT** discloses light is scattered in the detection volume).

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Regarding **Claim 25**: Because of the screen 15 (Fig. 1), a minimal amount of light from said light source is detected by said light detector when there are no wax crystals in the fuel, and the first wax crystals formed will inherently be formed at the coldest location, which would normally be at the thermal conductive surface, and the light source and light detector are mounted very near as claimed by Applicant.

**Regarding Claims 28-31 and 35-36:**

The method steps are met in the normal operation of the device disclosed by LAURENT (Col. 2, Lines 23-46): Regarding **Claim 28**: inputting fuel into the detection volume 20 (Col. 2, Line 30); directing light from the light source 10 into the detection volume; monitoring the light level at the light detector 16; cooling the diesel fuel in detection volume until wax crystals are formed, so that the light level monitored is changed; and recording temperature at a point where the light level changes, the recorded temperature at the point where the light level changes being the cloud point of the diesel fuel. Further regarding **Claim 31**: the cooling is done at a rapid pace so that a first sensed temperature and recording the first sensed temperature as a recorded approximate of the cloud point [and considered] is in the region of the cloud point of the fuel as claimed by Applicant. The limitations of **claims 29-30** are not considered to affect the method in a manipulative sense, since these are structural features that only define the detection area. Since LAURENT already includes a detection area, as described above, these limitations are considered to be met by LAURENT. Regarding **Claims 35 and 36**: To be given weight in a method claim, the claims must affect the method in a manipulative sense, therefore the position of the light source and detector of LAURENT are considered to meet these limitations and LAURENT already discloses that the wax crystals must be detected in order to determine the cloud point.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. **Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over **LAURENT** as applied to **Claims 1, 10, 17, 24-25, 28-31 and 35-36** above, and further in view of **GREEN** (U. S. Pat. No. 4,804,274).

Regarding **Claim 32**: **LAURENT**, to summarize, discloses all the limitations directed to the method as claimed by Applicant in Claim 32, as described above in Paragraph 5 as applied to **Claims 1, 10, 17, 24-25, 28-31 and 35-36**, further including the limitations wherein the changed light level is monitored.

**LAURENT** as described above, does not explicitly disclose the iterative method as claimed by Applicant in **Claim 32**, that is, recording an approximate of the cloud point, a first temperature point, then warming the fuel above the first temperature point, further cooling the diesel fuel at a slower rate, detecting the change and recording a second temperature point being a determination of the cloud point.

**GREEN** discloses (Col. 6, Lines 22-34) using an iterative method in a cloud point determination method.

**GREEN** further teaches that it is advantageous to use an iterative method in order to benefit from ability to more precisely determine the cloud point temperature.

**GREEN** is evidence that ordinary workers in the field of cloud point determination would recognize the benefit of using an iterative method as taught by **GREEN** for the cloud point method of **LAURENT** in order to more precisely determine the cloud point temperature.



Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the iterative method for the cloud point determination method of LAURENT in order to more precisely determine the cloud point temperature as taught by GREEN.

### ***Allowable Subject Matter***

9. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).
10. Claim 27 is allowable, but please correct the informalities noted above.
11. The following is a statement of reasons for the indication of allowable subject matter:
12. Claim 27 is allowable because the prior art fails to teach or fairly suggest a cloud point monitoring device, comprising: a ramp in said detection volume as defined in the claim, each element arranged and functioning as recited in claim 27 in combination with the other limitations of the claim.
13. Claims 2-9, 11-16, 19-23 and 33-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 2 and 12 would be allowable, and all their dependent claims share the same allowable features, in combination with the other elements of the respective claims, therefore they would likewise be allowable.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in PTO-892 and not mentioned above disclose related cloud point and other measurement devices and methods.

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr., whose telephone number is (571) 272-2248. The examiner can normally be reached on weekdays (Monday through Friday) from 8:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez (Art Unit 2859) can be reached at (571) 272-2245.

16. The *Official FAX* number for Technology Center 2800 is (703) 872-9306 for all official communications.

Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the official USPTO website at [www.uspto.gov](http://www.uspto.gov) or you may call the USPTO Call Center at 800-786-9199 or 703-308-4357. The Technology Center 2800 Customer Service FAX phone number is (703) 872-9317. The cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site, from the Office of Public Records and from commercial sources. Private PAIR provides external customers Internet-based access to patent application status and history information as well as the ability to view the scanned images of each customer's own application file folder(s).

For inquiries relating to Patent e-business products and service applications, you may call the *Patent Electronic Business Center (EBC)* at 703-305-3028 or toll free at 866-217-9197 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: [ebc@uspto.gov](mailto:ebc@uspto.gov). Additional information is available on the Patent EBC Web site at: <http://www.uspto.gov/ebc/index.html>.

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Stanley J. Pruchnic, Jr.  
3/21/05



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